

animal character. Thin threads, several inches in length, united into a complex network, which, in *E. aspergillum* are expressly described as horny and not siliceous, do not form a protruding tuft, but are rather external bent hairs, free only at the base. How far these external filaments of the *Euplectella*, which are very like those of *Hyalonema*, likewise resemble tubular cells I cannot say from my own inspection, as these very rare bodies were never accessible to me for examination. But undoubtedly I can detect no character of animal organization in the description, inasmuch as gelatinous interstitial parts occur also in large Fungi and Algæ (*Myxomycetæ*, *Tremella*, *Ulva*, and *Fuci*, the latter often edible in consequence of the amount of mucus and jelly they contain). It is also to be observed that in England no near relation was noticed between *Euplectella* and *Hyalomena*, although the latter had been in the British Museum since 1835, and Valenciennes in 1850 had already referred *Hyalomena* to the sponges; it then, as at present, was everywhere placed as a polype in the zoological museums.

7. The penetrating ammoniacal odour of the sponges occurs also in living *Characæ* and dead *Fucoidea*.

8. Another portion of the Phytolitharia are fillings up of variously formed vegetable cells analogous to woody deposits, or siliceous membranes, all without double refraction.

9. The Zoolitharia are isolated and often tubercular calcareous parts of a discontinuous, complete or partial, framework in the Echinodermata and other Radiata, the Corals, and many other forms, without any vasculiform character and with double refraction.

10. The animaliform *Bacillaria* furnished with openings, intercepting indigo, and creeping, are essentially different in the formation of their siliceous shells from the siliceous cells of plants.

11. It is probable that the great deposits of silica in these plants are only effected by means of the flow through them of extremely large quantities of water containing but little silica.

LXIII.—*Remarks on the River-Fishes of Chili.* By Dr. R. PHILIPPI, Director of the Mus. of Nat. Hist. at Santiago in Chili*.

ALTHOUGH we may affirm in general terms that Chili is poor in freshwater fishes, the number of these which it actually possesses is much more considerable than has hitherto been supposed. In Gay's work the only Percoid given is *Perca trucha*,

* Translated from the 'Monatsbericht der Berliner Akademie' for November 1866, by Arthur W. E. O'Shaughnessy.

further described and figured by Girard, in the 'United States Naval Astronomical Expedition,' as *Percichthys chilensis**.

Girard himself adds in this family, *Percichthys melanops* and *Percilia Gillisii*. I have described two other species as *Perca pocha* and *P. Segethi*, and am now able to add to the list a second species of *Percilia*; so that, instead of one, six Percoids are at present known to me as inhabiting the rivers of Chili. I believe, however, that there are yet more species of *Percichthys*.

I am convinced that there are many more species of *Atherina* (or, rather, *Basilichthys*) than the two given by Gay; however, I have not had sufficient leisure to examine closely the specimens existing in the Museum, or to have collections formed from the various localities.

The Carp family is entirely unrepresented in Chili. Of Siluroids, Guichenot in Gay's work enumerates one *Arius*, one *Hypostomus*, and four *Trichomycterus*: of the fourth species of the latter genus Girard has, with sufficient reason, made a new genus, *Nematogenys*. He himself gives a new species of *Trichomycterus*, *T. Macraei*, which, however, is from the province of Mendoza on the eastern side of the Cordilleras. *Hypostomus erinaceus* and *Trichomycterus nigricans* have not as yet come under my notice, and I doubt whether or not I possess *Arius papillosus*; on the other hand, I know five more species of *Arius*, three new species of *Trichomycterus*, and two new species of *Nematogenys*.

We do not find a single Salmonoid mentioned by Gay as found in Chili; I know, however, at least four, all belonging to the genus *Farionella* and to the province of Valdivia, where, on account of their want of scales, they are called *Peladillos*.

Of the Pike family, Gay mentions not a single species as belonging to the inhabited parts of Chili, and only two species of *Galaxias* from Tierra del Fuego. These diminutive representatives of our Pike are very abundant, however, in the rivers of Valdivia; but, as yet, I have not had time to accurately study the species. It is singular that they seem to be quite absent from the interior provinces of Chili, as do also the salmonoid *Peladillos*, while I believe that no Siluroid fish has as yet been found in Valdivia. I have at present no sufficient data to enable me to pronounce where the southern and northern river-fish faunas of Chili meet.

Of the Characinidæ one species, *Cheirodon pisciculus*, Girard, is apparently plentiful in most of the rivers of Chili.

* Girard has seen no spotted *Trucha* from Chili, neither have I; whence I conclude, 1st, that the Chilean *Trucha* is different from the Patagonian, 2nd, that Gay has figured the Patagonian for the Chilean fish. It would, in fact, be wonderful should the same river-fishes occur on both sides of the Andes.

Eels seem not to occur in the fresh waters of Chili; but the sea possesses a true Conger, which the fishermen call *Anquilla negra*, and to which I have applied the name *Conger chilensis*. The *Congrio* of the Chilian fishermen is no Malacopterygian; I have described it under the appellation of *Genypterus nigricans*; and the *Anquilla blanca* is *Bdellostoma polytrema*, Girard.

According to Gay the order Cyclostomata is entirely unrepresented; it is now, however, some time since a species, *Bdellostoma Dombeyi*, was made known through Dombey as occurring in the Chilian seas; and Girard has added a second, *Bd. polytrema*; while Gray mentions a *Velasia chilensis* (probably my *Thysanochilus valdivianus*) from the fresh waters. I have described two species of *Petromyzon*, *P. Foncki* and *P. acutidens*, as also several early stages of *Ammocætes* and *Chilopterygum*; whence it would seem probable that more species of *Petromyzon* will yet be afforded.

I will now enter into a short description of some of the river-fishes which appear to me to be new.

1. *Percilia gracilis*, Ph.

Corpore angusto; dentibus obtusis, cylindricis, subtruncatis.

From the waters of Peine in Santiago.

The entire length of the fish is 60 millim., its greatest height only 11½ millim., its thickness 7 millim. The head from the snout to the point of the gill-cover is 14 millim. long. With regard to the general form of the fish, we may notice the regular and rather strong curve of the head from the shoulder to the snout; the back and belly present regular, equable and gradual curves. The nasal apertures are situated each in a rather long depression, bounded by a sharp ridge; and the space between the two ridges is also depressed. The eyes are 4 millim. in diameter. The forehead and shoulder are scaleless; the scales of the præoperculum and of the operculum are smaller than those of the body, which are large, rough, and ciliated.

The upper surface and dorsal fin, as also the caudal, are grey; the ventral surface and anal fins whitish; the chest and ventral fins bright citron-yellow. Lateral line bent suddenly beneath the middle of the second dorsal fin. The numbers of the fin-rays are as follows:—I. D. 7; II. D. 10; A. 3-7; P. 15; V. 6; C. about 18.

2. *Arius papillosus*.

Cuvier and Valenciennes have described and figured (vol. xv. p. 118, t. 431) under this name a fish said by Gay to be from Chili; and under the same name we find a fish described by Guichenot in Gay, and figured by him (vol. ii. p. 305, and t. 5 bis,

f. *i*), the figure not being referred to in the text. However, these two representations exhibit striking differences at the very first glance. First of all, both lobes of the caudal are represented by Cuvier and Valenciennes as very pointed, whereas Gay makes them rounded as in all other Chilean species of *Arius* known to me. But since in Cuv. and Val. it is evident, from the relative position of the rays, that the upper half of the fin is represented as the lower, I attribute these discrepancies to an error of the draughtsman. Thus the ventral fin is represented by Cuvier as considerably shorter than it is made to appear by Gay; the anal is also much shorter, and the breadth attained by the adipose fin is much greater in Cuvier's figure; it is, in fact, equal to the space between the first dorsal and the adipose, while this space is represented by Gay as once and a half as great as the length of the base of the adipose fin.

According to Cuvier and Valenciennes the coloration is greyish, with somewhat of green on the back, and, as the figure shows, without any spots; whereas Gay describes it as brownish, with green spots on the back, and his figure represents, in fact, the entire fish varied with brown spots, the back brown, sides green, belly grey, all these colours subsiding one into the other. It is characteristic of *A. papillosus* to have the palatine teeth obtuse and almost granular (*dents mousses et comme grenues*). I have seen this character of the teeth in no other *Arius*.

3. *Arius carcharias*, Leyb.

In the year 1859, Fr. Leybold described a second species in the 'Anales de la Universidad de Chile,' p. 1083, under the above name, and presented the specimen which had served him for the description to the Museum. The plate of the same referred to by him in the text has not yet been published. His description runs:—

A. corpore brevi, regionem pectoralem versus lato, depresso, postice compresso, elongato; capite omnino nudo, depresso; rostro prominente, triangulato-acuminato, obtusiusculo; maxilla superiore et inferiore, membrana branchiostega et isthmo papillosis; cirrhis tantum duobus, crassis; cute undique molli; oculis parvis, ovalibus, supremis; pectoralibus rhomboideis, undique inermibus; ventralibus rotundato-truncatis; dorsali et anali angustatis, truncatis; caudali furcata; linea laterali recta; dorso lateribusque griseis, abdomine albo.

I now quote from the Spanish description:—"The nasal apertures are large, placed very near to each other, and sur-rounded, and at the same time separated, by a lamellar fleshy membrane. The pectoral fins are entirely without teeth . . . ; the adipose fin is lanceolate. D. 1 . 8; P. 1 . 8; V. 6; C. 20."

The number of the anal rays is not given. Most of the characters given by Leybold are generic ones, and belong to all the species of *Arius*; that, however, of the spine of the pectoral fin being unserrated (for this is what is actually meant by the expression “pectoralibus undique inermibus—pectorales sine dente aliquo”) would be a very peculiar one; but beyond a doubt this rests on an error. In the living or freshly killed specimens the teeth on the hinder edge of the pectoral spine are not apparent; but in the same specimens after a longer immersion in spirit they become even more conspicuous than in any other species. Nevertheless I look upon *A. carcharias* as a good and easily definable species; for, in the first place, it has only eight rays in the anal fin, while *A. papillosus* has twelve; and in the second, the lips, chin, gill-membranes, and isthmus are thickly covered or, so to speak, paved with large, broad, flat warts, and not with small papillæ “qui rendent la peau comme saigneuse.”

4. *Arius villosus*, Ph.

On examining the specimens of *Arius* in the Museum on the occasion of Herr Leybold's present of *A. carcharias* to the collection, I found another species (differing from both *A. papillosus* and *A. carcharias*), which I named *A. villosus*, but, being otherwise occupied, had not then the leisure to describe. It is characterized by having almost the entire body thickly covered with a minute down, almost densely pubescent. The under surface of the head has the large warts of *A. carcharias*; but they are not so close together, and project more. The adipose is very large, and reaches, when laid back, to the fleshy borders of the caudal. (These fleshy borders are, by the by, entirely forgotten in Cuvier and Valenciennes's figure of *A. papillosus*.) The entire fish measures 186 millim. in length, and the adipose fin is 31 millim. long and 8 millim. high. The membrane separating the nostrils appears to me larger than in other species, and forms a valvular covering to the upper nasal aperture, surrounding the lower mostly as a projecting lamellar border. The colour is a very pale reddish brown, passing into pure white on the belly. The number of the fin-rays is as follows:—D. 17; A. 11; C. 18; P. 18; V. 6.

The rays of the caudal are difficult to count, by reason of the thick membranous covering which hides them; I do not think, however, that there are twenty of them. The rays of the anal fin are as long as those of the first dorsal. The palatine teeth are as large and as pointed as those of the maxillary, and form two slightly diverging oval patches.

5. *Arius squalus*, Ph.

The fore part of the body is thickly covered with minute

papillæ; but the hinder part is quite smooth. The inferior surface of the head is scarcely papillose, without any warts, and consequently very different from the condition of this part in both the preceding species. The membrane between the nostrils is considerably smaller than in *A. villosus*. The adipose is comparatively small, and the ventral seems smaller than in the other species; the first measures 20 millim., while the total length of the fish is 164 millim. Coloration above blackish grey, gradually passing into the greyish white of the belly. The number of the fin-rays is:—D. 1. 7; A. 9; C. 20-22; P. 1. 9; V. 6. The palatine teeth are proportionally as large and long as those of the maxillary, and form two strongly diverging oval patches.

From *A. papillosus* this species is distinguished by the smaller number of the rays of the anal fin (which in that species are twelve), and by the condition of the palatine teeth, which are not smaller than the maxillary teeth, and not “mousses et comme un peu grenues.”

I received this species a few days since from the waters of Peine, in this province; the fishermen call it *Tollo*, Shark—a name which I suspect they apply to all the species of *Arius*.

6. *Arius micropterus*, Ph.

A specimen long preserved in spirits, and, after a superficial examination, referred by me to *A. papillosus*, is, however, very distinctly removed from it by the comparative smallness of the adipose and ventral fins, and by the palatine teeth being much larger than the maxillary teeth; they form two slightly diverging oval patches. The adipose fin has a length of only 28 millim. and a height of 6 millim., for a total length of 214 millim.; the ventrals are only 19 millim. long (These fins are of the same length in *A. squalus*, which measures only 164 millim., and has the adipose only 20 millim. long and 8 millim. high.) The number of fin-rays is, I find, as follows:—D. 1. 8; A. 9; C. 18-20; P. 1. 9; V. 6. The fore part of the body is strongly papillose; the hinder part smooth. Coloration blackish above; beneath whitish: the pectoral and ventral fins are whitish at the commencement, blackish towards the tip.

7. *Arius synodon*, Ph.

This species is rendered very distinct by the fact that the palatine teeth do not form two separate oval patches, but a single transverse trapezoid rounded off at the angles; in other points they nearly resemble the maxillary teeth. The form of the body also is slenderer, the head being not quite one-fifth, or scarcely more than one-sixth, of the length of the body, while in the other species it is nearly one-fourth of the same.

The fore part of the body is, as in most of the species, beset with minute papillæ, the hinder portion being quite smooth. The total length is 201 millim.; length of the head 34, its breadth the same, and its greatest height 20 millim.; the greatest height of the body at the middle of the dorsal fin is 32 millim.; tail 27 millim. high and $11\frac{1}{2}$ millim. in thickness. Number of the fin-rays:—D. 1. 7; A. 11; C. 18–20; P. 1. 9; V. 6. The adipose is 26 millim. long and 7 millim. high. Coloration uniform grey, darker on the upper parts; the lower surface lighter.

Note.—All the species of *Arius* have in the axilla, above the pectoral fin, and immediately under the end of the os coracoideum, two apertures, one behind the other, the anterior one being the smaller.

8. *Trichomycterus areolatus*, Cuv. & Val.; Guich. in Gay, ii. p. 309.

Easily distinguished from the other species by the singular folded appearance of the skin on the under surface of the head.

9. *Trichomycterus maculatus*, Cuv. & Val. U. S. N. A. Exp. p. 243, tab. xxxiv. f. 1–3.

Guichenot has not given the number of the fin-rays; Cuv. and Val. give D. 15, A. 9; Girard, however, has D. 13, A. 8.

10. *Trichomycterus marmoratus*, Ph.

Blackish-grey, varied with numerous small black spots resembling those of *Tr. punctatus*; the ground-colour of the tail is more of a brownish yellow; belly white and spotless, as are also the pectoral, ventral, and anal fins; dorsal and caudal blackish. Its shape is slenderer than that of *Tr. punctatus*, Cuv. and Val., as the admeasurements will show: length of the largest of the four specimens at hand 119 millim.; length from tip of snout to commencement of dorsal 55 millim.; length of dorsal 10 millim.; distance between end of dorsal and end of caudal 36 millim.; height of dorsal $7\frac{1}{2}$ millim.; greatest height of body 11 millim. The lips are smooth, without papillæ; the maxillary barbels are as long as those of the nasal region, shorter than the head, and black. The under surface of the head shows no areolæ. I find the fin-formula to be as follows:—D. 10; A. 6; C. about 14; P. 8; V. 6. This species is therefore easily distinguished from *Tr. areolatus* by the condition of the skin of the inferior surface of the head, and the number of the rays in the dorsal and anal fins; from *Tr. maculatus* by the last-mentioned character and its blackish colouring.

11. *Trichomycterus tigrinus*, Ph.

This species is easily discerned at the first glance by its coloration. It shows on a white ground numerous reddish-

brown round dots, which, however, are absent from the fins; the lower surface of the head and the belly as far as the tail are white, as are also the ventrals and anal. The pectoral is remarkably broad, and blackish at the base. Both lips are thickly beset with tolerably large wart-like papillæ, very much as in *Arius carcharias*. All the lower barbels are of equal length, as long as the opening of the mouth, and whitish. Length of the fish 118 millim., of the head $18\frac{1}{2}$ millim.; greatest height 15 millim.; height of the tail 9 millim. Number of rays in the fins:—D. 10; A. 6; P. 8; V. 5.

12. *Trichomycterus pallens*, Ph.

This species also is easily distinguishable by its colouring: it is of a pale reddish white, after having been kept a long time in spirit, and the fins are quite colourless; what the colour may have been during lifetime I am unable to say. The sides of the body present, as in the foregoing species, and as, indeed, in so many fishes, an inconspicuous darker longitudinal streak. The lips are completely smooth; the maxillary barbels are longer than the nasal ones, and the longest reach quite to the opercular margin. The spines of the suboperculum are very strong as compared with the small size of the fish. The largest specimen measures only 72 millim., of which the head is 11 millim.; the breadth of the head is 14 millim., its height 8 millim.; greatest height of the body 12 millim., that of the tail 8 millim. Number of rays in the fins:—D. 9 or 10; A. 6; P. 8; V. 5.

13. *Nematogenys inermis*, Girard, U. S. N. A. Exp. p. 240, t. xxxii. f. 1-3.

Trichomycterus inermis, Guichenot in Gay, ii. p. 312, tab. 9. f. 2.

I possess several specimens, which correspond exactly in colour &c. with the figure given by Gay.

14. *Nematogenys nigricans*, Ph.

This fish is anteriorly almost entirely black above; the tail presents a rather bright yellowish ground, which is varied with black spots. The inferior surface is white anteriorly, varied with blackish spots on the sides, and with a short blackish stripe with white spots; the hinder half is entirely blackish. The dorsal and caudal are blackish, as also the upper surface of the pectoral; the ventrals and anal are white, with blackish spots; the entire body is thickly beset with papillæ, which are largest upon the lips. The barbels at the angle of the mouth do not reach to the root of the pectoral. The size and proportions of the body are the same as in *N. inermis*; I do not, however, believe this to be a mere colour variety.

15. *Nematogenys pallidus*, Ph.

This species also corresponds with *N. inermis* in size, form, and number of the fin-rays; but, whilst in the latter species the skin of the belly is quite smooth, in *N. pallidus* it is as thickly and conspicuously beset with papillæ as the back, lips, &c.; and the coloration is very different, viz. a bright brownish red, almost a flesh-colour: it is only on the head also that any darker spots are to be distinguished, and they are here, moreover, but ill defined. Scarcely any darker cross markings are to be seen on the dorsal and caudal fins; the other fins are perfectly white. The barbels do not reach to the origin of the pectoral.

LXIV.—Description of a new Species of Rissoa from Madeira.

By J. GWYN JEFFREYS, F.R.S.

THE Rev. R. B. Watson has kindly sent me specimens of a *Rissoa*, found by him at Madeira, which appears to be undescribed; and, at his request, I will now record the discovery.

Rissoa picta.

Shell conic-oval, rather solid, semitransparent, and glossy: *sculpture*, numerous (although not close-set) slight, equal-sized, spiral striæ, which cover the body-whorl, but are not discernible on the upper whorls; there is no labial rib: *colour* pale yellowish-white, variegated by equidistant rows of oblong reddish-brown spots; the body-whorl has three rows (the lower two being sometimes partially confluent), and each of the upper three whorls has two rows: *spire* rather short, bluntly pointed: *whorls* five and a half, somewhat compressed, encircled below the suture by a thickened rim, owing to the last-formed whorl overlapping the preceding one in that part; the body-whorl occupies about two-thirds of the shell: *suture* slight: *mouth* roundish oval, not expanded: *outer lip* sharp: *inner lip* reflected on the pillar and base, united above with the outer lip: *pillar* broad and flattened: *operculum* yellowish, rather thick, nearly smooth; *spire* or nucleus small, and placed on the inner side near the base. Length 0·075 in., breadth 0·05.

Habitat. Under stones at low-water mark, Madeira (Watson); not uncommon.

The nearest ally to this pretty little shell is *R. semistriata*, from which it differs not only in the smaller size, but in the whorls being flatter, the sculpture equal and not confined to the upper and lower portions of the body-whorl, and in having three (instead of two) rows of coloured spots on that whorl, and two on each of the preceding whorls.